CLAIMS

We Claim:

1. A method of initializing a peer-to-peer network of devices, at least one of said devices remotely located at a remote node, said remote node being connected to a hub port on said network, said method comprising the steps of:

    a) scanning remote nodes for nodes requesting communications channel addresses for unassigned active communications channels;

    b) identifying a requesting node for channel address assignment;

    c) assigning an unassigned channel address to said identified node; and

    d) repeating steps (b) and (c) until all requesting nodes have received channel addresses for all corresponding active communications channels.

2. A method as in claim 1. wherein the step (a) of scanning remote nodes comprises the steps of:

    i) providing a null packet to each remote node for synchronization:

    ii) receiving a return null packet from said each remote node, said return null packet indicating a number of unassigned active communications channels at said remote node.

3. A method as in claim 2. wherein the step (i) of scanning remote nodes further comprises providing power to said remote nodes.

4. A method as in claim 2. wherein unassigned active communications channels are indicated by a non-zero value in a left frame and a right frame of each unassigned active communications channel.

1   5.   A method as in claim 2, wherein the step (b) of identifying a requesting node
2   comprises the steps of:
3   i)   shifting a first bit of an identification number onto a signal line, said
4   identification number being unique to the hub port connected to said requesting
5   node;
6   ii)   monitoring said signal line to determine whether said signal line
7   matches such shifted bit;
8   iii)   shifting a next bit onto said signal line; and
9   iv)   repeating steps (ii) and (iii) until all bits have been shifted onto such
10   signal line.

1   6.   A method as in claim 5, wherein in the identification step (b)(ii), when the
2   signal line does not match the bit shifted onto the signal line, then at least one other
3   node is requesting an address. said identification step (b) further comprising the
4   steps of:
5   ii1)   discontinuing identification;
6   ii2)   waiting until address assignment is complete for said other requesting   .
7   node; and
8   ii3)   returning to step (c)(i).

1   7.   A method as in claim 6, wherein when the first bit is shifted onto the signal
2   line, step (b)(i) further includes asserting an initialization ready line; and, step
3   (b)(ii1) further includes releasing said initialization ready line.

1   8.   A method as in claim 7, wherein the step (b)(ii2) of waiting until address
2   assignment is complete comprises the steps of:
3   A)   monitoring said initialization ready line for an indication that said other
4   node is being initialized; and
5   B)   waiting until said initialization ready line indicates said node has been
6   initialized.

1   9.   A method as in claim 8, wherein the step (c) of assigning addresses
2   comprises the steps of:
3   i)   monitoring an address-in-use line;
4   ii) sequentially placing addresses on an address bus; and
5   iii) assigning addresses not indicated as being in use by said address-in-use
6   line.

1   10.   A method as in claim 9, wherein one node is identified as a master node, the
2   master node sequentially placing the addresses on the address bus and assigning
3   addresses and, wherein as each address is presented on said address bus in step (ii),
4   corresponding nodes, having been assigned said addresses, assert said address-in-use
5   line to indicate that said presented address is assigned.

1   11.   A method as in claim 10, wherein in the step (b) of identifying a requesting
2   node a plurality of nodes assert a need-initialization signal and, wherein when an
3   address has been assigned to each node, said requesting node releases said need-
4   initialization signal indicating the initialization process has been completed, said
5   need-initialization signal remaining asserted until addresses have been assigned to
6   all active communications channels.

1   12.   A method as in claim 11, wherein said initialization process is started
2   responsive to a power on condition.

1   13.   A method as in claim 11, wherein said initialization process is started
2   responsive to a manual initialization request.

3   14.   A method of adding new remote nodes to a media network, said method
4   comprising connecting said requesting node and an associated device to a hub port
5   and initializing as in claim 11.

15.   A method of initializing a peer-to-peer network of devices, at least one of said devices remotely located at a remote node, said remote node being connected to a hub port on said network, said method comprising the steps of:

a)   identifying one hub port as a bus master, said bus master asserting an initialization signal to being network initialization;

b)   scanning remote nodes to identify if any nodes are requesting address assignment for unassigned active communications channels responsive to said initialization signal;

c)   identifying a requesting node for channel address assignment;

d)   assigning an unassigned channel address to said identified node; and

e)   repeating steps (c) and (d) until all requesting nodes have received channel addresses for all corresponding active communications channels.

16.   A method as in claim 15, wherein after all requesting nodes have been assigned addresses in step (e), said method further comprises placing said identified bus master port in a normal operating state, said bus master operating identically to other hub ports.

17.   A method as in claim 16, wherein in the step (b) of scanning remote nodes comprises the steps of:

i)   providing a null packet to each remote node for synchronization; and

ii)   receiving a return null packet from said each remote node, each said return null packet indicating a number of unassigned active communications channels at a corresponding said remote node.

18.   A method as in claim 17, wherein unassigned active communications channels are indicated by a non-zero value in a left frame and a right frame of each unassigned active communications channel.

19.   A method as in claim 17, wherein each hub port connected to a remote node participates in said identification step (c), said identification step (c) comprising the steps of:

i)   shifting a first bit of an identification number onto a signal line, said identification number being unique to the hub port connected to said requesting node;

ii)   monitoring said signal line to determine whether said signal line matches each shifted bit;

iii)   shifting a next bit onto said signal line; and

iv)   repeating steps (ii) and (iii) until all bits have been shifted onto such signal line.

20.   A method as in claim 19, wherein in the identification step (c)(ii), when said hub port determines that the signal line does not match the bit shifted onto the signal line, then at least one other node is requesting an address, said identification step (c) further comprising the steps of:

ii1)   discontinuing identification for said connected requesting node;

ii2)   waiting until address assignment is complete for another requesting node connected to another hub port; and

ii3)   returning to step (c)(i).

21.   A method as in claim 20, wherein when the first bit is shifted onto the signal line, step (c)(i) further includes asserting an initialization ready line; and, step (d)(ii1) further includes releasing said initialization ready line.

22.   A method as in claim 21, wherein the step (c)(ii2) of waiting until address assignment is complete comprises the steps of:

A)   monitoring said initialization ready line for an indication that said other node is being initialized; and

B)   waiting until said initialization ready line indicates said other node has been initialized.

23.   A method as in claim 20, wherein if in the identification step (c)(ii) the signal line matches every shifted bit, the matching hub port is assigned addresses in step (d), the step (d) of assigning addresses comprising the steps of:

   i)   monitoring an address-in-use signal line;

   ii)   sequentially placing addresses on an address bus, each respective other hub port asserting said address-in-use signal responsive to an address on said address bus previously assigned to said other hub port, said bus master placing addresses on said address bus; and

   iii)   automatically assigning addresses not indicated by said address-in-use line as being in use by other said hub ports.

24.   A method as in claim 23, wherein said initialization process is started responsive to a power on condition.

25.   A method as in claim 24, wherein said initialization process is started responsive to a manual initialization request.